

REMARKS

Claims 1–38 are currently pending in the subject application, and are presently under consideration. Claims 1–38 are rejected. Claims 1, 7, 12, 16, 17, 18, 21–26, 29, 33, 34 and 38 have been amended. The amendments to claims 21–23, and 33 correct minor informalities and typographical errors. Favorable reconsideration of the application is requested in view of the amendments and comments herein.

I. Rejection of Claims 1–38 under 35 U.S.C. 103(a)

Claims 1–38 have been rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,877,056 to Cypher ("Cypher") in view of U.S. Patent Pub. No. 2002/0129211 to Arimilli, et al. ("Arimilli"). Applicant's representative respectfully requests that this rejection be withdrawn for at least the following reasons.

Claim 1 has been amended recite that a first node includes a conflict state machine that manages non-data responses to a broadcast source request. The amendments to claim 1 are supported by at least paragraphs [0046]–[0050] of the Specification. Cypher taken in view of Arimilli fails to teach or suggest a first node that provides a broadcast request for data, the first node including a conflict state machine for managing non-data responses to the broadcast request for the data provided from the first node, the first node receiving a read conflict response to the broadcast request from the first node, the read conflict response indicating that a second node has a pending broadcast read request for the data, the conflict state machine transitioning to a conflict state in response to the first node receiving the read conflict response, as recited in amended claim 1. In particular, no process or structure in Cypher or Arimilli (taken individually or in combination) corresponds to the conflict state machine recited in amended claim 1. Significantly, Cypher and Arimilli, taken individually or in combination, fail to teach or suggest any structure or process that can track the nature or type of non-data conflict responses, as does the conflict state machine recited in amended claim 1. As a result, there is insufficient evidence to conclude that the approaches in the cited combination art would be combined to provide a system that operates to resolve a transaction (a broadcast request for data) in the manner recited in amended claim 1.

In contrast to amended claim 1, Cypher is related to a coherency protocol employed within multiprocessor computer systems having shared memory architectures (See Cypher, Col. 1, Lines 10-13). As admitted in the Office Action, Cypher fails to teach or suggest a first node receiving a read conflict response (See Office Action, Page 3). Consequently, Cypher fails to teach or suggest a conflict state machine that transitions to a conflict state based on a first node receiving a read conflict response, as recited in amended claim 1. The addition of Arimilli does not make up for the deficiencies of Cypher. Arimilli discloses that a response logic 30 combines a snoop response of a coherency decision point (CDP) with snoop responses of other agents to produce a combine response (See Arimilli, Par. [0032]). Arimilli also discloses that in the case of multiple conflicting requests, the combined response informs an agent 10 that issued a transaction whether or not it "won" arbitration performed by the CDP and is the new owner of a target cache line (See Arimilli, Par. [0032]). However, no process or structure taught or suggested by Arimilli corresponds to the conflict state machine that manages non-data responses to a first node that provides a broadcast request for data, as recited in amended claim 1.

Additionally, Cypher taken in view of Arimilli fails to teach or suggest a third node that provides requested data to a first node in response to a broadcast request from the first node, the first node filling the data provided by the third node in a cache associated with the first node based on the state of the conflict state machine. As stated above, neither Cypher nor Arimilli, taken individually or in combination, teaches or suggests employment of a conflict state machine. Thus, Cypher taken in view of Arimilli cannot teach or suggest taking a particular action, such as filling data provided by the third node in a cache associated with the first node based on the state of the conflict state machine, as recited in amended claim 1. Thus, in contrast to the cited art, the system recited in amended claim 1 allows data to be filled in order to resolve the transaction issued by the first node in a conflict situation without retry for certain conflicts. Accordingly, Cypher taken in view of Arimilli fails to teach or suggest the system recited in amended claim 1 since Cypher taken in view of Arimilli fails to teach or suggest the conflict state machine recited in amended claim 1. Therefore, Cypher taken in view of Arimilli does not make amended claim 1 obvious and amended claim 1, as well as claims 2-15 depending therefrom, is patentable over the cited art.

Additionally, Cypher taken in view of Arimilli fails to teach or suggest that a broadcast request provided by a first node is broadcast using a first cache coherency protocol, the first cache coherency protocol being chosen by the first node based on the state of the conflict state machine, as recited in amended claim 7. As stated above with respect to amended claim 1, from which amended claim 7 depends, Cypher and Arimilli, taken individually or in combination, fail to teach or suggest any process or structure that reads on a conflict state machine. Thus, Cypher taken in view of Arimilli cannot teach or suggest taking a particular action (e.g., choosing a first cache coherency protocol to resolve a transaction) based on a state of the conflict state machine, as recited in amended claim 7. Accordingly, Cypher taken in view of Arimilli fails to make amended claim 7 obvious since Cypher taken in view of Arimilli fails to teach or suggest a conflict state machine.

Furthermore, Cypher taken in view of Arimilli fails to teach or suggest that a broadcast request provided from a first node is broadcast using a source broadcast cache coherency protocol, the broadcast cache coherency protocol being chosen by the first node based on a state of the conflict state machine, as recited in amended claim 12. For reasons similar to amended claim 7, Cypher taken in view of Arimilli cannot teach or suggest the system recited in amended claim 12 since Cypher and Arimilli, taken individually or in combination, fail to teach or suggest a conflict state machine. Accordingly, Cypher taken in view of Arimilli fails to make amended claim 12 obvious.

Claims 16 and 24 have been amended to recite a conflict state machine (associated with a first processor node) transitioning to a first conflict state of a plurality of conflict states if a first processor node receives a read conflict response, the conflict state machine transitioning to a second conflict state of the plurality of conflict states if the first processor node receives a second conflict response. The amendments to claims 16 and 24 are supported by at least paragraphs [0046]-[0050] of the Specification. For the reasons stated above with respect to amended claim 1, Cypher taken in view of Arimilli fails to teach or suggest any structure or process that corresponds to a conflict state machine, as recited in amended claims 16 and 24. Additionally, since Cypher taken in view of Arimilli fails to teach or suggest a conflict state machine, Cypher taken in view of Arimilli cannot teach or suggest that any particular action is taken, such as the first processor node being operative to implement a cache fill with data provided from a third

node (or third processor, as recited in amended claim 24) if the conflict state machine transitions to a particular state (e.g., a first conflict state), as recited in amended claims 16 and 24. Similar to as discussed above with respect to amended claim 1, since Cypher and Arimilli, taken individually or in combination, fail to teach or suggest any structure or process that can track and distinguish the nature of different types of conflict responses, as does the conflict state machine recited in amended claim 16 and 24, the approaches in the cited combination art cannot be combined to provide a system that operates to resolve a transaction in the manner recited in amended claims 16 and 24. For these reasons, Cypher taken in view of Arimilli fails to teach or suggest a multi-processor network, as recited in amended claim 16 or a computer system, as recited in amended claim 24. Accordingly, amended claims 16 and 24, as well as claims 17-23 and 25-28 depending therefrom, are patentable over the cited art.

Additionally, Cypher taken in view of Arimilli does not teach or suggest a first processor node being operative to issue a request for data using a forward progress technique if the conflict state machine transitions to a second conflict state in response to the first processor node receiving the second conflict response, as recited in amended claims 17 and 25. For the reasons stated above with respect to amended claims 16 and 24, from which claims 17 and 25 respectively depend, Cypher taken in view of Arimilli does not teach or suggest that any particular action is taken if a conflict state machine transitions to a particular state (e.g., a second conflict state), as recited in amended claims 17 and 25. Accordingly, Cypher taken in view of Arimilli fails to make amended claims 17 and 25 obvious since Cypher taken in view of Arimilli fails to teach or suggest a first processor node being operative to issue a request for the data using a forward progress technique if the conflict state machine transitions to a second conflict state in response to the first processor receiving a second conflict response, as recited in amended claims 17 and 25.

Furthermore, claims 18 and 26 have been amended to recite a first processor node that is prevented from implementing a cache fill with data provided by a third node (or third processor, as recited in amended claim 26) if a conflict state machine transitions to a second conflict state in response to the first processor receiving a second conflict response. For the reasons stated above with respect to amended claims 17 and 25, Cypher taken in view of Arimilli fails to teach or suggest the elements recited in amended claims 18 and 26 since Cypher taken in view of Arimilli

fails to teach or suggest that any particular action is taken by a first processor node based on the state of a conflict state machine. Accordingly, Cypher taken in view of Arimilli does not make amended claims 18 and 26 obvious.

Claim 29 has been amended to recite that means for providing a broadcast request includes means for managing non-data responses to the broadcast request and for transitioning among a plurality of conflict states in response to the non-data responses. The amendments to claim 29 are supported by at least paragraphs [0046]-[0050] of the Specification. For reasons similar to those discussed above with respect to amended claims 1, 16 and 24, Cypher taken in view of Arimilli fails to teach or suggest means for managing non-data responses to a broadcast request and for transitioning among a plurality of conflict states in response to the non-data responses, as recited in amended claim 29. Moreover, claim 29 has been amended to specify that the means for managing non-data responses transitions to a conflict state according to a highest priority non-data response that is received by the provider of the broadcast request. Thus, in contrast to the approaches taught by Cypher in view of Arimilli, the conflict state in amended claim 29 is explicitly determined by the priority of a non-data response to allow certain action (e.g., placing data from the third node in the requestor's cache) to occur based on the particular conflict state.

Furthermore, since Cypher taken in view of Arimilli fails to teach or suggest means for managing non-data responses to a broadcast request and for transitioning among a plurality of conflict states in response to the non-data responses, as recited in amended claim 29, Cypher taken in view of Arimilli cannot teach or suggest means for placing the data from a third node in a cache associated with the first node in response to a read conflict response from a second node causing the means for managing non-data responses to transition to a conflict state, as recited in amended claim 29. For these reasons, Cypher taken in view of Arimilli does not make the system recited in amended claim 29 obvious. Accordingly, amended claim 29, as well as claims 30-33 depending therefrom, is patentable over the cited art.

Claim 34 has been amended to recite transitioning a state of a conflict state machine associated with a first node based on a read conflict response being a highest priority non-data response that is received by the first node. The amendments to claim 34 are supported by at least paragraphs [0046]-[0050] of the Specification. For the reasons similar to those discussed above

with respect to amended claim 1, Cypher taken in view of Arimilli fails to teach or suggest transitioning a state of a conflict state machine, as recited in amended claim 34. Additionally, since Cypher taken in view of Arimilli fails to teach or suggest transitioning a state of a conflict state machine, Cypher taken in view of Arimilli fails to teach or suggest placing the data provided by a third node in a cache associated with the first node based on the state of the conflict state machine, as recited in amended claim 34. For these reasons, Cypher taken in view of Arimilli fails to make amended claim 34 obvious. Thus, amended claim 34, as well as claims 35-37 depending therefrom, is patentable over the cited art.

Claim 38 has been amended to recite that a source broadcast second conflict has a higher priority than a source broadcast read conflict such that a computer system is operative to reissue a request for data from the source node using a forward progress protocol mode request for data when there is both a source broadcast protocol read conflict and a source broadcast protocol second conflict with one or more other nodes in the computer system. The amendments to claim 38 are supported by at least paragraphs [0046]-[0050] of the Specification. For the reasons stated above with respect to amended claims 1, 16, 24 and 29, Cypher taken in view of Arimilli fails to teach or suggest the computer system recited in amended claim 38. In particular, claim 38 recites a hybrid cache coherency protocol that can choose a particular protocol (e.g., a source broadcast protocol or a forward broadcast protocol) based on the nature of source broadcast conflict responses in the computer system. Significantly, no node, as taught by Cypher and Arimilli includes any structure or process that can choose a protocol based on the nature and priority of a conflict, as does the computer system recited in amended claim 38. Consequently, the approaches taught in Cypher taken in view of Arimilli can not operate to resolve a transaction in the manner recited in amended claim 38. Accordingly, Applicant's representative respectfully submits that Cypher taken in view of Arimilli fails to make amended claim 38 obvious, and amended claim 38 is patentable over the cited art.

II. CONCLUSION

In view of the foregoing amendments and remarks, Applicant respectfully submits that the present application is in condition for allowance. Applicant respectfully requests reconsideration of this application and that the application be passed to issue.

Should the Examiner have any questions concerning this paper, the Examiner is invited and encouraged to contact Applicant's undersigned attorney at (216) 621-2234, Ext. 106.

No additional fees should be due for this response. In the event any fees are due in connection with the filing of this document, the Commissioner is authorized to charge those fees to Deposit Account No. 08-2025.

I hereby certify that this correspondence is being transmitted to the U.S. Patent and Trademark Office via electronic filing on August 27, 2007.

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